

SPITFIRE Doctoral Training Partnership (DTP)

Research Experience Placement Project 2019

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| Lead Supervisor: | Prof Ian Townend |
| Email: | i.townend@soton.ac.uk |
| University/Research Organisation: | University of Southampton |
| Department: | FELS (SOES) and FEPS (Coastal Engineering) |
| Project Title: | The exploration of a Beach Vulnerability Index for England |

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| Total Student Support Costs: £ | Student will receive an hourly pay of £8.44 p.h. and is required to work for 30 hours a week over an 8 week period. |
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| Proposed Start Date: 1 July 2019 (<i>flexible start date</i>) | Proposed End Date: 23 Aug 2019 (<i>flexible end date</i>) |
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Projects should run over the summer vacation and we recommend that projects will have terminated by 25 September 2019.

Brief Summary

This should include:

- *Project outline;*
- *Links to staff/School/Centre activity as appropriate;*
- *Supervisory arrangement;*
- *How space/equipment/supporting resource demands will be met;*
- *Elements of the project that will incorporate elements other than computer/modelling e.g. fieldwork and data collection;*
- *How the project will enhance the skills of the appointed student;*
- *Any intellectual property rights concerns that may arise from the work.*

Motivation: In the UK, the increased potential for floods and erosion is clearly identified in national assessments. The hazard potential in the coastal zone is a product of marine drivers such as sea level, storms and geomorphology, human activities/uses and how we adapt those uses to the hazard. This raises the question: what are the trends in the components which collectively control coastal resilience?

Aim: Review existing approaches to assessing resilience and vulnerability, and develop a Beach Index that can be applied at a national scale.

Key tasks: the project will involve a literature review, data compilation and analysis, development of software algorithms, site visits, laboratory sample analysis (if required) and report writing.

Links/supervision: the project will be led by Prof Townend from SOES but will be link with the NERC CoastalRes team and be co-supervised by Prof Nicholls in Engineering and Dr Lazarus in Geography and Environment.

Resources: The student will be based at SOES where office space will be provided. Other than computing, the requirement for site visits and any laboratory materials can be met by the supervisors.

Skills: the project is scoped as a mini-research project. In a short period of time the student will experience the components of establishing what has already been done, scoping how best to tackle the research question, planning and implementing a work programme, learning about data quality, handling and analysis, developing some algorithms to implement the proposed method, working at a field site and in the laboratory (and associated health and safety requirements), and writing a technical summary.

IPR: the student will make use of existing data and software, all of which are open source/public domain. Any data, algorithms or software developed within the project will be added to the existing repositories under the same licence conditions.

Please give an indicative timescale for the student's work over the length of the project:

This should include:

- *The broad tasks the student will undertake;*
- *An indicative timescale for these tasks.*

Using the available literature and drawing on the material about coastal processes and beach morphology, the student will identify the key attributes that contribute to defining a beach vulnerability (or resilience) index. These ideas will then be tested and validated using the CCO data for a range of beaches around the English coast. The tasks envisaged include:

- Literature review (2 weeks);
- development and testing of analysis tools (4 weeks)
- site visits to collect additional data (e.g sediment samples) and analysis of data in lab (a few days within rest of programme)
- application and validation of index (1 weeks)
- drafting of summary report (1 week).

Proposed procedure for appointing students, including selection criteria:

Please identify specific criteria that should be considered for the selection of placement students e.g. specific quantitative skills that may be required, subject knowledge etc. If a student has been pre-selected, or the research area has been led by the student, please provide the student's contact details, and a summary of their suitability for the SPITFIRE DTP REP programme.

The student will need to be numerate and have a good knowledge of a procedural programming language (e.g. Matlab, python or Fortran). Some knowledge of coastal processes and or coastal zone management would be beneficial but are not essential.